Installing RedHat Linux 7.2

ITOS Edition
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1 Overview

This is a recipe for installing RedHat Linux 7.2 from a CDROM. See `http://www.redhat.com/` to obtain the RedHat-Linux CD. See `http://www.linux.org/` for general information about Linux.

This recipe is optimized for PCs that will run the ITOS.

Since each PC is a little bit different, you might have to tweak this recipe a little to get it to work on your particular machine. It should be close on all machines, though.

2 Hardware Considerations

At today's prices, you can get a workstation quality PC for under $3000. We're talking Pentium-III, SCSI, 21-inch monitor; top-notch components throughout.

Some things to consider:

1. Check the type of ethernet and graphics card used. Ensure, via the RedHat Hardware compatibility site, the cards are suppported. Download any drivers if available.
2. Should the ethernet capability be internal to the motherboard, Beware; you may need to physically unplug the machine to re- initialize the network interface.
3. Get a high-quality 21 inch monitor and a mainstream video card. If price is an issue, sacrifice something else. Don't go smaller than 17-inch – ITOS assumes at least 1152x864 resolution; you can't see that many pixels on a smaller monitor.
4. Get lots of RAM. 64MB is a good minimum; you'll feel the difference between 64MB and 128MB.
5. Get a SCSI controller. You don't have to get SCSI disks (IDE wins on price/performance) but it's nice to be able to attach an external tape drive or CD burner!
6. Don't worry about the CPU. ITOS runs fine on a Pentium 133 – anything you can buy today is faster.

3 Preparing to Install

Answer these questions before starting the install:

1. How big is your hard disk?
2. Will Linux be the only operating system, or will you also install Windows or other OS's?
3. If you plan to install other OS's, will you have at least 1500MB for Linux?
4. Do you have an IDE disk?
5. If you have an IDE disk, what is its LBA geometry?
6. What kind of video adapter do you have?
7. What kind of monitor do you have?
8. What are the monitor's horizontal and verical sync rates?
9. Is the CMOS clock set to UTC or local time?
10. What is this machine's IP name?
11. IP address?
12. Subnet mask?
13. Default gateway?
14. Primary nameserver?
15. Will this be an NIS client?
16. If this will be an NIS client, on what NIS domain?
17. If this will be an NIS client, what is the server's name?

4 Install Linux

1. Boot Linux CD-ROM.
2. *Welcome to RedHat Linux 7.2*: Press ⟨Enter⟩.
3. *Language Selection*: Click ⟨Next⟩ to accept the default language, which is English.
4. *Keyboard Configuration*: Click ⟨Next⟩ to accept the default values (Test Keyboard if you like).
5. *Mouse Configuration*: If you don't have a 3-button mouse, select ⟨Emulate 3 Buttons⟩. Click ⟨Next⟩.
6. *Welcome Screen*: Click ⟨Next⟩.
7. *Install Type*: Select ⟨Custom⟩ and click ⟨Next⟩.
8. *Disk Partition Selection*: Select ⟨Manually Partition with Disk Druid⟩ and click ⟨Next⟩.
9. *Disk Setup*:
   - '`/boot`' should be at least 20M
   - '`/`' must be at least 250M
   - '`/var`' should be at least 250M
   - '`swap`' should be double you RAM
   - '`/usr`' should be at least 3100M
   - '`/space`' or '`/export`' anything left over

   click ⟨Next⟩.
10. *Boot Loader Configuration*: Click ⟨Next⟩ to accept defaults
11. *GRUB Password*: Do NOT use a GRUB password. Select ⟨No GRUB password⟩ and click ⟨Next⟩
12. *Network Configuration*: Unselect ⟨DHCP⟩. Type in network information and click ⟨Next⟩
13. *Firewall Configuration*: Select ⟨No firewall⟩ and click ⟨Next⟩
14. *Additional Language Support*: Click ⟨Next⟩ to accept default language, which is English
15. *Time Zone Selection*: Choose your time zone. Do NOT select ⟨System clock uses UTC⟩. Click ⟨Next⟩
16. *Account Configuration*: Enter the root password. Do NOT configure user accounts yet
17. *Authentication Configuration*:
    - Unselect ⟨Enable MD5⟩
    - Unselect ⟨Enable Shadow Passwords⟩
    - Select ⟨NIS⟩ (Enter NIS information)

    click ⟨Next⟩
18. *Package Group Selection*: Scroll to the bottom of the list and select ⟨Everything⟩. Click ⟨Next⟩
19. *Graphical Inteface X Configuration*: Should auto select you card. Click ⟨Next⟩
20. *About to install*: Click Next to install Red Hat Linux
21. *Installing Packages*: This takes several minutes (perhaps up to an hour)

22. *Create Boot Disk*: Insert Blank Floppy Disk and click ⟨Next⟩
23. *Monitor Configuration*: Should auto select card. Click ⟨Next⟩
24. *Choose Default Desktop*: Select ⟨KDE⟩. Test settings by clicking ⟨Test Settings⟩. If everything is ok click ⟨Next⟩
25. *Done*: Congratulations, initial installation is complete. Remove any floppy disks. When ready click ⟨Next⟩. CD will automatically eject.
26. *Reboot*: Reboot the computer from hard disk
27. *Pause GRUB booting*: The system should come with with the GRUB graphical login screen. Press ⟨up arrow⟩ to stop the count down
28. *Get kernel and initrd information*: Type ⟨e⟩ (Done to see the kernel line). From this point on the kernel line assummed will be /vmlinuz-2.4.7-10 ro root=/dev/sdb2 and the initrd line is assummed to be /initrd-2.4.7-10.img but you should write down and use your own.
29. *Boot into single user mode*:
    - Type ⟨c⟩.
    - Enter ⟨kernel <modified kernel line>⟩ to boot into single user mode. For example ⟨kernel /vmlinuz-2.4.7-10 ro S root=/dev/sdb2⟩, notice the extra S.
    - Enter ⟨initrd <initrd line>⟩. For example ⟨initrd /initrd-2.4.7-10.img⟩.
    - Boot machine
30. *Edit '`/etc/hosts`'*: Add NIS server to '`/etc/hosts`' file. Must be here in order for NIS to work properly. Otherwise you can only log in as root. When your are done your '`/etc/hosts`' should look similar this:

```
127.0.0.1       localhost
128.183.221.1   <machine_name> <machine_name.domain_name>
128.183.221.2   <nis_server_name> <nis_server_name.domain_name>
```

31. *Edit '`/boot/grub/grub.conf`'*: Add lines to allow for booting into single user mode. The following is an example of a completed '`/boot/grub/grub.conf`' file. Your lines should be similiar, notice the difference between the two kernel lines

```
title Red Hat Linux 7.2
        root (hd0,0)
        kernel /vmlinuz-2.4.7-10 ro root=/dev/sdb2
        initrd /initrd-2.4.7-10.img
title Red Hat Linux 7.2 (Single User Mode)
        root (hd0,0)
        kernel /vmlinuz-2.4.7-10 ro S root=/dev/sdb2
        initrd /initrd-2.4.7-10.img
```

32. *Reboot*: Reboot the machine by typing ⟨reboot⟩.
33. *Test Single User Mode*: When GRUB comes up select ⟨single user mode⟩ (Did it come up ok?).
34. *Reboot*: Reboot using default boot sequence (Non-single user mode).
35. Installation Complete

5 Initial Configuration

1. *Add symbolic links*: Add the following
   - ln -s /bin/bash /usr/local/bin/bash
   - ln -s /bin/tcsh /usr/local/bin/tcsh
   - ln -s /usr/bin/perl /usr/local/bin/perl
2. *Add shells*: Add the folling to '`/etc/shells`':
   - /usr/local/bin/bash
   - /usr/local/bin/tcsh
3. *Remove Applications*:
   - *Remove ddd*:
     ```
     # rpm -e ddd
     #
     ```
   - *Remove kaffe*:
     ```
     # rpm -e kaffe
     #
     ```
   - *Remove nedit*:
     ```
     # rpm -e nedit
     #
     ```
   - *Remove lesstif*:
     ```
     # rpm -e lesstif-devel
     # rpm -e lesstif
     #
     ```
   - *Remove jikes*:
     ```
     # rpm -e jikes
     #
     ```
4. *Configure tcp wrappers*: Edit '`/etc/hosts.allow`' and '`/etc/hosts.deny`'. Start off by denying everything to everyone by changing '`/etc/hosts.deny`' to:

   ```
   ALL: ALL: banners /etc/banners
   ```

   Next create banners. Here's how we do it – your organization might require different wording:

   ```
   # mkdir /etc/banners
   # cd /etc/banners
   # cat > in.telnetd
                            U.S. GOVERNMENT COMPUTER
             If not authorized to access this system, disconnect now.

                       YOU SHOULD HAVE NO EXPECTATION OF PRIVACY
   By continuing, you consent to your keystrokes and data content being monitored.
   ⟨^D⟩
   # cp in.telnetd in.rshd
   # cp in.telnetd in.rlogind
   ```

```
# cp in.telnetd /etc/motd
# sed 's/^/220-/' in.telnetd > in.ftpd
```

Finally, grant permissions by editing '`/etc/hosts.allow`'. To open up ssh to any host in your domain, make '`/etc/hosts.allow`' look something like:

```
sshd, sshdfwd-X11: .my.domain
```

5. *Fix potential X11 security hole*: Edit '`/usr/X11R6/lib/X11/xdm/Xaccess`' to close a potential security hole:

```
# cd /usr/X11R6/lib/X11/xdm
# mv Xaccess Xaccess-dist
# echo '# no-one can run xdm remotely' > Xaccess
#
```

6. *Configure the root account*: Edit '`/root/.bashrc`' to your preferences.
7. If you're an NIS client, verify that NIS is running. See Section A.3 [NIS], page 9.
8. Symbolic link '`/usr/include/db1/ndbm.h`' to '`/usr/include/ndbm.h`':

```
# cd /usr/include
# ln -s db1/ndbm.h .
# cd /usr/lib
# ln -s libgdbm.2.0.0 libndbm.so
```

6 Install packages

1. *Install super*: Download if from super (`ftp://sunland.gsfc.nasa.gov/pub/packages/redhat_7_2/i386/super-3.14.0-1.i386.rpm`)

```
# rpm -i super-3.14.0-1.i386.rpm
# cat > /etc/super.tab
root    /bin/bash u+g=0 info="become root" \
        <insert authority users here w/out brackets>
⟨^D⟩
#
```

2. *Configure sshd*: Now edit '`/etc/ssh/sshd_config`':

```
# change PermitRootLogin to 'no'
# change IgnoreRhosts to 'yes'
# change PermitEmptyPasswords to 'no'
```

3. *Install texinfo and texi2www*: Available at texinfo+texi2www (`ftp://sunland.gsfc.nasa.gov/pub/tarfi`

```
# tar zxvf texinfo-3.12t+texi2www.tgz
# cd texinfo-3.12t+texi2www
# ./configure && make && make install
# make TEXMF=/usr/share/texmf install-tex
#
```

4. *Install openmotif*: Obtain RPM files from the Open Group's OpenMotif site (`http://www.opengroup.org/openmotif/downloads.html`). Choose the Metro Link version and download both the Runtime RPM and Development RPM for Linux/x86.

```
rpm -i openmotif-2.1.30-4_MLI.i386.rpm
rpm -i openmotif-devel-2.1.30-4_MLI.i386.rpm
```

5. *Install java 1.4.0 beta*: Get java 1.4.0 RedHat RPM from Sun (`http://java.sun.com/j2se/1.4/#linux`)

```
# cd /usr/java
# sh j2sdk-1_4_0-beta3-linux-i386.bin
#
```

   Follow the instructions and installation will be complete.

   Be sure your PATH has '`/usr/java/bin`' in it.

6. *Install JLex*: Get '`JLex-1.2.5-Main.java`' from JLex (`ftp://sunland.gsfc.nasa.gov/pub/tarfiles/J`

```
# mkdir /usr/local/JLex
# cp JLex-1.2.5-Main.java /usr/local/JLex/Main.java
# cd /usr/local/JLex
# javac Main.java
#
```

7. *Install jikes*: Get jikes (`ftp://sunland.gsfc.nasa.gov/pub/packages/redhat_7_2/i386/jikes-1.15-glibc2.2.i386.rpm`)

```
# rpm -i jikes-1.15-glibc2.2.i386.rpm
#
```

Appendix A Miscellaneous Procedures

A.1 The automounter AMD

We use the AMD automounter to manage home directories.

A.2 GNOME and Enlightenment

A.3 NIS (aka Yellow Pages)

A.4 XF86Config

Here's an 1152x900 mode line we use with monitors that can't do 1280x1024:

```
Modeline "1152x900"   95.00  1152 1188 1340 1472   900  906  909  939
```

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